REMARKS

Claims 1 through 5, 7 through 10, and 12 through 21 remain in this Application. Claim 11 has been canceled, and substantially all of its subject matter has been incorporated into independent claim 8. Claim 6 has been canceled and substantially all of its subject matter has been incorporated into claim 1. New claims 22 and 23 have been added (no new fees are implicated by these new dependent claims since an equal number of dependent claims have been canceled in this response).

Enclosed herewith are formalized drawings (sheets 1 through 7, all Figures, 1 through 11). Acceptance of these replacement sheets of drawings in this application is respectfully solicited.

Independent claim 1 has been amended to specify that a mechanical mechanism causes movement of the hydrometeors relative to the system, and to further specify a corrective model mechanism including characterization of radiation being emitted by and scattered from hydrometeors for further refining instrument performance in the presence of hydrometeors.

Independent claim 1 as formerly presented was rejected by the Examiner under 35 USC 102(b) as being anticipated by the teachings in the patents to Walton

(No. 6,064,344) or Hill (5,065,615). Dependent claim 6 was rejected under 35 USC 103 as being obvious from the teachings in the Hill patent in view of the teachings in Japanese patent number 9-138272.

Enclosed herewith is a partial translation of the Japanese patent cited by the Examiner in rejecting dependent claim 6 as being obvious under 35 USC 103(a). This patent teaches only use of a rain gauge 500 to determine rate of rain fall onto a weather radar radome so that the signal attenuation due to the water film on the radome can be estimated and corrected for. There is no teaching or suggestion in the Japanese patent of correction for the amount of "precipitation in the environment" as stated by the Examiner (only of water film on the window) or of characterization of radiation being emitted by and scattered from hydrometeors.

A "hydrometeor" as used in the art and in these claims is defined as precipitation particles in liquid, ice or mixed or wetted phase (see page 1, second full paragraph). As taught in this Application beginning at the bottom of page 13, weather nowcasting and forecasting microwave radiometers have heretofore generally not yielded usable observations in the presence of hydrometeors, thus the effects of radiation being

scattered or emitted by hydrometeors have not been included in various related instrument modeling. There is no such teaching in any of the patents relied upon by the Examiner herein of use of mechanical movement of precipitation at the instrument window together with a corrective model mechanism including characterization of radiation being emitted by and scattered from hydrometeors for further refining instrument performance in the presence of hydrometeors as now specified in independent claim 1. It is thus felt that claim 1 should now be allowable over the relied upon references.

Claims 2 through 5 and 7 are dependent on claim 1, directly or indirectly, and should be allowed with the independent claim.

The subject matter formerly set forth in dependent claim 11 (indicated by the Examiner to be allowable and now canceled) has substantially entirely been incorporated into independent claim 8 (excepting only the characterization of the window as a "radome", which terminology is not felt to affect the allowability of the claim), and the dependency of claims 12 and 14 has been changed accordingly. It is felt that claim 8 should thus now be allowed. Claims 9, 10, and 12 through 18 are

dependent on claim 8, directly or indirectly, and should be allowed when the independent claim is allowed.

Independent method claim 19 has been amended to delete reference to employing at least one mechanism for reliably refining instrument output during the precipitation event (this subject matter is now found in claim 20), and to specify the step of modeling radiative transfer, including effects of radiation being emitted by and scattered from hydrometeors.

The Walton patent has been cited under 35 USC 102(b) by the Examiner in rejecting claims 19 through 21 as previously presented. This patent (as well as the other references relied upon by the Examiner) does not teach or suggest modeling radiative transfer, including effects of radiation being emitted by and scattered from hydrometeors, for mitigation of effects of hydrometeors present at an antenna system as now specified by independent claim 19 herein. It is thus felt that independent claim 19 should now be allowed.

Claims 20 through 23 are dependent on independent claim 19, directly or indirectly, and should be allowed when claim 19 is allowed.

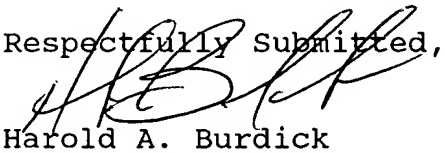
Claim 20 has been amended to change dependency (to claim 19) and to make more clear that the "system"

referred to in the claim is the "antenna system" referred to in claim 19. These changes should satisfy the rejection of claims 20 and 21 under 35 USC 112, second paragraph, and withdrawal of this rejection is requested.

The period for response has been extended (for one month, from June 13, 2006 to July 13, 2006) by Petition for Extension of the Period for Response and fee ($60.00 for a small entity) submitted herewith.

In view of the foregoing, it is felt that all of the claims now remaining in this Application are allowable, and accordingly, allowance of these claims, followed by passage of this Application to issue, is respectfully solicited.

Respectfully Submitted,



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Translation from Japanese

0016
The Signal processing section 400 consists of Analog/Digital (A/D) transformation 401, Clutter suppression circuit 402, Mesh averaging circuit 403, Attenuation correction circuit 404, and Precipitation intensity processing circuit 405. A/D transformation instrument 401 convert received data in 300 to digital signal.

0017
The clutter suppression circuit 402 remove clutter effect from surface from received data in A/D transformation instrument 401, and output only refraction signal from meteorological target.

0018
Mesh averaging circuit 403 use the data from the clutter suppression circuit 402, and compute spatial average for each mesh by considering volume of meteorological target.

0019
The averaged data in the mesh averaging circuit 403 and surface observation data of precipitation are inputted in the attenuation correction circuit 404. The surface observation data is observed in rain gauge observation instrument 500 which is set near the antenna instrument.

0020
The attenuation correction circuit 404 compute attenuation A based on correction formula (1) by use observed precipitation Rg .

0021
Equation (1)
$A = 12.239 \times \log(Rg) - 13.487$

0022
The attenuation factor A is correction for radar rainfall instrument, and the value of A depends on thickness of water on radome 101.

0023
The attenuation correction circuit 404 corrects the received signal by using the attenuation factor A. The corrected data is inputted by precipitation intensity processing circuit 405.

0024
The precipitation intensity processing circuit 405 compute precipitation intensity by using radar equation and the received data in the attenuation correction circuit 404. The resulted precipitation intensity is inputted by display instrument.

0025
To summarize, the radar precipitation observation system shown above corrects attenuation of received data from water cover on radome by using thickness on the radome 101 and precipitation data observed near the radome101.

0026

Hence the radar precipitation observation system makes it possible to observe precipitation intensity for wide area with high precision. The invention is not limited on the radar system, and it can be applicable to various instruments.

0027

[Effects of innovation]

As described above, the innovation make possible to correct attenuation effect of radio wave due to water cover on antenna radome based on rain gauge instrument observed near the antenna site.

0028

Hence, the innovation provides radar precipitation information under the rainfall with the same quality of that under non-precipitation cases.

[Explanation of figures]

[Figure 1] Block diagram of circuits showing one example how to use the innovation.

[Explanation of numeric numbers]

100: Antenna section
100: Radome
102: Antenna
200: Antenna control section
300: Transmitting/receiving section
400: Signal processing section
401: A/D transformation section
402: Clutter suppression circuit
403: Mesh averaging circuit
404: Attenuation correction circuit
405: Precipitation intensity processing circuit
500: Rain gauge observation instrument